

**Comparison of Management Reports and Critical Success Factors at The Ford Meter Box
Company**

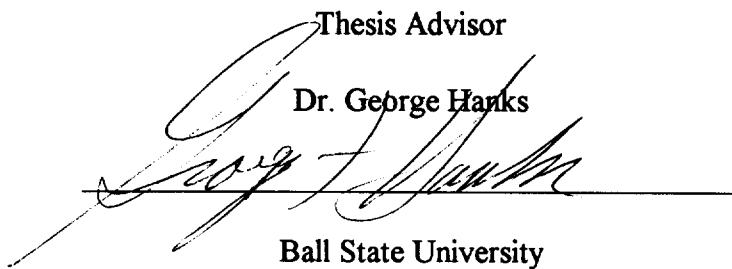
An Honors Thesis (HONRS 499)

by

Brian C. Elliott

Thesis Advisor

Dr. George Hanks

A handwritten signature in dark ink, appearing to read "George Hanks", is written over a horizontal line. The signature is fluid and cursive.

Ball State University

Muncie, IN

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THE PROJECT

Managers rely on receiving data or information to make critical decisions. One way that a manager receives this information is by reading and interpreting internal reports. Managers, from the shift supervisor to the president of the company, are able to use the information provided by internal reports to plan for the future or analyze past decisions. It is imperative that each internal report be understandable by every manager who uses it. A wrong decision could result from misinterpreting the data in a report. It is also important for each report to touch on the issues of the company that are key to its success.

The purpose of this paper is to compare the Critical Success Factors (CSF) to the internal reports of The Ford Meter Box Company. Critical Success Factors are those things that make the company successful. The paper will also show how managers that work with the reports feel about using them. After analyzing this information, suggestions will be provided for any changes that need to be made by Ford.

ACKNOWLEDGMENTS

I would like to thank the people at Ford Meter Box for allowing me to do this project. The people of the company provided the information needed to do this paper. They took the time to answer all of the questions I had for them plus added many bits I did not ask about. I would also like to thank Dr. Hanks for being my advisor for this paper. His expertise and past writing experience on this subject has been very valuable. Last, but not least, I would like to thank the Honors College for giving me the approval to go ahead with my paper idea.

THE COMPANY

The company being used for this paper is The Ford Meter Box Company located in Wabash, Indiana. Ford Meter Box is one of the largest makers of products for the water works industry in the world. Besides the plant in Wabash, Ford also owns another facility located in Pell City, Alabama. The company employs about one-thousand people at these two locations (Ford Quality Brochure).

Ford Meter Box is a company with an innovative past. The company was started by Edwin H. Ford when he opened up small basement workshop in Hartford City, Indiana to produce meter boxes in 1898. Edwin, at the time, was the superintendent of a new water works in Hartford City. The city used water meters to hold homeowners and businesses accountable for the overuse of water. The installation of water meters was a problem at the time because few homes or businesses had basements to put them in and it was important that the meters not be subjected to freezing temperatures. That is why they could not be placed into the ground without protection from the cold. Edwin Ford solved the problem of putting the meters in the ground by developing an underground meter box to hold the meter (Ford Quality Brochure).

Word got out about the underground meter box and water works people from neighboring facilities began asking Edwin Ford to make the meter boxes for them. The meter box was an important invention to the water works industry because it allowed for the metering of water consumption in cold climates. Soon, business was booming and a location change had to be made in order to keep up with the demand for meter boxes (Ford Quality Brochure).

In 1911, Edwin Ford decided to move his company to Wabash, Indiana and have the company incorporated. The building in Wabash was four stories high and housed thirty

employees. Additions to the original building have been commonplace since 1951. In the late seventies, the facility was expanded to include more room for the production areas and an in-house foundry (Ford Quality Brochure).

The company has developed many products throughout the years. Ford's products are used by contractors and water utilities throughout the United States and many other countries. Most of the products that the company makes were first designed to solve a customer problem and later became a standard item because of its usefulness. This type of innovation has gained Ford Meter Box about a seventy percent share of the water works market (Ford Employee Manual 6).

THE PRODUCTS

The Ford Meter Box Company has been known for its manufacturing of water meters and testing equipment since the 1960's. The first meter box produced by Ford used a special aid for installation and removal of the meter. The use of this aid led to the invention of various types of meter boxes such as the crescent, yoke, and gulfbox. These newer models of meter boxes come standard with locking lids, inlet and outlet connections, and valves. Ford Meter Box has also created copper meter setter line used for supporting and positioning the meter for indoor or outdoor use. Another of Ford's products, the water meter testing device, is widely used by the industry. In fact, Ford Meter Box supplies about ninety percent of the water meter testing equipment sold in the United States (Ford Quality Brochure).

Ford Meter Box is also a leader in the production of valves and fittings which are used to connect the meter with the main water lines. In the fifties, Ford created the pack joint compression coupling which connects the service line piping. This pack joint system can be found on all of the valves, meter settings, and couplings that Ford offers. In the sixties, Ford introduced the ball valve to the market. The ball valve is different than the standard key valve because it allows for easier turning and higher resistance to high water pressure. Today, the ball valve outsells the key valve due to its advantages. Ford also makes corporation stops and single and dual check valves. These valves are produced like the normal ball valve with modifications for installation convenience. These modifications had to be made in the product because of the differences in meters and piping that each utility uses. A catalog showing most of Ford's products is located in Appendix A of this paper.

The products discussed above are produced in Wabash. The other plant, located in Pell City, produces pipe products and Uni-flange devices. Pipe products and Uni-flange devices are used to fix pipes that have broken or weakened. These products represent a different product line and are not included in this study of Ford's reports.

THE PRODUCTION PROCESS

The purchases of raw materials at Ford Meter Box are done by the Purchasing Department. The purchasing department depends on information provided by department supervisors in order to determine the quantity to buy. Ford Meter Box uses three major raw materials which are iron castings, copper tubing, and brass ingot. Ford also buys miscellaneous parts, cartons (for shipping), and various other supplies from vendors. Of all of the materials bought by Ford, the most important one is brass (Ford Employee Manual 6).

The brass ingot is kept in storage until the foundry needs it. In the foundry, the ingot is melted in electric furnaces at over two-thousand degrees. A group of machines in the foundry make cores that are used in the production of the part molds. These cores are placed in the molds to form the hollow tubing of each part. The cores are sent to the areas where the molders work and the molder creates the part mold by using a special type of sand that has a black tint. A mold is created by compacting the black sand onto a pattern.

When the mold is finished, it is placed on a skid with four other molds and sent to the pouring floor. The mold is poured after the metal has reached the right temperature. The person responsible for pouring the molds picks up the metal in a crucible suspended on a monorail. The monorail goes from the pouring floor to the five furnaces that are located in the middle of the foundry. After the metal is poured and has had time to cool, the molds go to the shakeout area. This is the machine that separates the sand and the cores from the casting (Ford Employee Manual 8).

The sand goes to a holding area to be used again, and the castings are sent on to a carousel where the individual parts are pulled off by hand. When all of the parts are separated,

they are cleaned and excess metal is eliminated from the part by use of a grinding wheel. The end result of the foundry's work is unmachined valves and couplings (Ford Employee Manual 8).

Almost all of the parts that use brass go through this process.

The unmachined parts are sent to the machine department at the front of the plant by truck. This is where the castings are reamed, shaped, and threaded with precision lathes and other machines. The parts have now been refined so that the individual production departments can use them (Ford Employee Manual 8).

One of the individual departments that does further work on the parts is key valve. Key valve assembles and tests the key valve. Even though it has use disadvantages, the key valve is still a popular item because some utilities have not switched to the ball valve. The corporation stop is also made in this department. The corporation stop is a special valve that connects the individual house service pipe to the water main. Key valve is also in charge of producing saddles for various water mains (Ford Employee Manual 8, 9).

Another department that does further work on these parts is ball valve which is in charge of assembling and testing ball valves. This, as said before, is the most popular type of valve used today and has become a standard for controlling the flow of water to homes. The last department in this area is check valve. Check valve assembles and tests check valves, compression valves, and expansion connections. This department also makes the pack joint coupling which is created by using rubber gaskets (Ford Employee Manual 8).

There are some departments that stand on their own as far as the production process is concerned. One of these departments is the rubber plant which makes all of the gaskets used in pack joint couplings and other products. The copper department is in charge of bending and

spinning copper tubing in order to form a meter-holding device. The device is then soldered to a casting. The tester department is in charge of producing the equipment used to test water meters. The department makes testers that can handle various sizes of meters. The last production department is the iron department which makes the meter boxes and covers. Ford Meter Box does not make the iron components used for the meter boxes. They purchase iron covers and meter boxes from several foundries and do finishing work on them. For example, they paint most of the iron parts and assemble a locking device on the covers (Ford Employee Manual 9, 10).

All of the finished products go to the shipping department where they are boxed up and stored until they are sold. Most of the products are custom made, so a lot of the inventory is shipped out as soon as it is made. The shipping department is able to keep track of orders and mailing information, as well as inventory, by using the Data General computer terminals located all around the shipping department. Ford Meter Box ships its products out by UPS, other couriers, or its own trucks. Ford's fleet of trucks is operated by the traffic department (Ford Employee Manual 10).

The last three departments are indirectly involved in the production process. They are important because they support all of the other departments. The tool department designs and makes all of the tools and jigs needed for the machines. The pattern department is in charge of making the patterns for the molds produced in the foundry and the maintenance department is in charge of repair to the buildings, grounds, and machinery (Ford Employee Manual 10).

This is a summary of the whole production process carried out at the Wabash plant. A figure showing the departments is contained in Appendix B of this paper. The production process at the plant never stops, except for holidays. Deliveries are constantly made by vendors in order

to keep the production process going. Ford Meter Box does not use a Just-in-Time inventory system because it makes a lot of special orders. When the special orders are down, production works on the regular products offered by Ford (Ford Employee Manual 20).

CRITICAL SUCCESS FACTORS

For the next part of the paper, I went to Ford Meter Box and asked three managers what they thought were the most important aspects of the production process. The people interviewed ranged from top to lower level management. This group was chosen because they deal directly with the reports that will be compared with the CSFs. The CSFs are what these people believe to be key to the company's survival. When comparing the internal reports to the CSFs, there should be some type of connection or else the report needs to be changed or a new one created.

To better understand what a Critical Success Factor is, it is necessary to quote Boynton and Zmud. Boynton and Zmud said:

Critical Success Factors are those few things that must go well to ensure success for a manager or an organization, and, therefore, they represent those managerial or enterprise areas that must be given special and continual attention to bring about high performance. Critical Success Factors include issues vital to an organization's current operating activities and to its future success (Chung 21).

The first step in this paper is to identify the Critical Success Factors for Ford Meter Box. When asking the managers what they thought was most important to the success of the company, the quotation above was given as the definition of a CSF. The three managers that participated in the interviewing were: Paul Sare, middle management; Tim Burgess, top level management; and Dan Elliott, lower level management. The CSFs I received from the managers were similar for the different management levels. The only difference appeared at the lower level of management

where CSFs tended to be specific to that lower level manager's area. When compiling the final list of CSFs, it was necessary to take those CSFs given by the lower level manager and adjust them for the whole plant.

After the list of CSFs was compiled by the three managers at each level, five of them were deemed to be most crucial to the success of the company. These five are (listed in no particular order):

- 1) Keeping raw materials costs to a minimum
- 2) Product quality
- 3) Customer Service
- 4) Raw and finished materials inventory maintenance
- 5) Accurate Scheduling of machines for different jobs

The purpose of this paper is to match the Critical Success Factors with the internal reports of the company, not to decide what the most important Critical Success Factor is.

The first CSF on the list is keeping raw materials costs to a minimum. The main raw material that goes into most of Ford's products is brass. Upper level management keeps their eyes on the price of brass at all times. A penny increase in the cost of brass can make a significant difference in Ford's profits. Ford has ample storage area for all the raw materials that they buy so they can take advantage of a decrease in the price of a certain raw material at any time. Plus, the extra space allows them to take advantage of economies of scale by ordering large quantities from the vendors they purchase from. Ford has been able to keep brass costs down by carefully watching the brass market. Some years they have great success in brass purchasing and are able

to pass on cost savings to the customer. Other years, the cost of brass is so high that it causes Ford to pass part of the increase on to the customer.

The second CSF talked about is quality. Quality products is the main reason Ford has a dominant market share. Quality is the responsibility of each person that works at Ford Meter Box. It is not left up to a "quality control" department to ensure that all goods meet the standards of the customer. Ford is taking added steps to ensure that quality continues to be a priority. In 1993, Ford started a large project designed to document work procedures as guided by ISO 9000 standards. The ISO 9000 project will play an important role in the consistency of products produced at Ford. The projects documentation of work procedures will provide every person who works for the company a blueprint for the way processes need to be done to achieve maximum quality. Each person will need to be aware of the steps involved in inspecting products at each stage of the production process. This type of consistent inspection is necessary for maintaining a defect-free product.

Another CSF is that of customer service. Catering to the customer's needs is crucial to what Ford does as a company. To insure good customer relations, Ford has a large staff of salespeople that have a technical background in the water works industry. In a company that makes specialized products, a salesperson must be able to tell a future customer whether or not he or she can guarantee that the product be made on time at a reasonable cost. Ford also has a customer service group that deals with product questions as well as billing problems. The last department at Ford that deals with the customer is the foreign department which is in charge of all overseas sales. The people involved in this department have had years of experience in dealing with foreign customers.

The fourth CSF on the list is raw and finished materials maintenance. Ford keeps large finished goods inventories on hand in order to serve the customer in a timely manner. A large inventory is important to Ford because it allows them to concentrate on special orders instead of taking up valuable machine time by making the standard product. Ford does not have enough resources to make the conventional product at the same time that they make the specialty items. The conventional products are made when special orders are down so that worker down time is minimized and dollar output per worker is maximized. In a production setting such as this, it is important that raw materials be on hand at all times. Ford Meter Box sends out orders to its vendors well ahead of time so that they will have them ready for the production line when they need them. A stop in work due to lack of materials at Ford is intolerable. This is why it is critical that the purchasing department be aware of what is going on out in the factory.

The last Critical Success Factor on the list is scheduling of machines for different jobs. In most departments, this is not a problem because there are so few processes that take place. In the machine department, through which almost every part passes, there are few machines and many parts to handle. Each part that goes through the machine shop has a scheduled time for production. This time is placed located in the machine department office. The wall of the office is full of notecards with information about each part (run time, number of parts, ect.). Next to this wall is a cabinet full of engineering diagrams for each part. These are used by the laborers who work on non-computerized lathes (some of the lathes that do intricate, close-up work are computerized--they are pre-programmed with engineering information). This whole process can get backed-up by missing windows in which parts were supposed to be made. For example, if a part was supposed to be machined at ten, but came in twenty minutes late, there would be dead

time for that worker of twenty minutes because nothing else can be run at that time due to long machine set-up times.

MANAGEMENT REPORTS AT FORD METER BOX

The managers at Ford Meter Box use a number of internal reports to measure productivity. These reports give the managers at Ford an idea of where they stand and what they should change. Thus, reports need to be written in a clear and concise manner so that each manager can understand what the report is saying about the status of the company. The reports that are generated by Ford Meter Box have been around for a long time. The controller of the company, Tim Burgess, can remember being taught about what the reports meant by someone who had been around the company for forty years. This stability in the reporting system probably means that everyone is very familiar with what the reports are trying to say about the company. On the other hand, not making some worthwhile changes to the reports could cause the company to become complacent and possibly miss information that could lead to more profitability (Burgess).

Ford believes that its cost accounting system is not as formal as some companies have because some costs that could be directly related to the product are not. For example, the rubber gaskets that are put on the pack joint couplings are put into overhead instead of directly costed to the part. This means that every part manufactured at Ford shares in the gasket expense which means that the pack joint coupling's cost to produce is smaller than what it should be (Burgess).

The information that Ford uses to produce its reports comes from different sources. For example, overhead costs are estimated by using last years overhead expenses. The cost of brass and labor is figured by using invoices and piecerate sheets. All of this information is put together in order to find the cost for each item produced (Burgess).

There are three factors that figure into the costing of each product which are: labor, brass cost, and overhead. Labor is figured by using the piecework incentive program. In other words, a worker gets a certain dollar amount per hour worked if he or she produces the number of parts required per hour. This number of parts required per hour is formulated by the production department based upon a time study. Thus, the cost of labor for a certain part is the rate per hour of work done divided by the number of parts produced in the hour. For example, the rate requirement for a part is ten parts per hour. The worker has to make ten parts per hour in order to get the top wage of ten dollars per hour. Using this information, the labor cost for each part is one dollar ($\$10 \text{ rate} / 10 \text{ parts per hour} = \1 per part) (Burgess).

The next element that goes into the cost of the product is the amount of brass used. Ford Meter Box knows the brass weight used in the manufacturing of each part they make. They come up with a figure for the cost of brass that they use per pound by figuring a weighted average cost from recent purchases. They take this brass cost per pound and multiply it by the brass weight of the part. For example, a part contains two pounds of brass and brass is estimated to cost Ford a dollar and fifty cents per pound. The brass cost of the part is then figured to be three dollars ($2 \text{ pounds} * \$1.50 \text{ per pound of brass} = \3 per part) (Burgess).

The last cost that goes into the price of each part is overhead which is figured by using last years costs. Tim Burgess takes the costs from last years trial balance that are considered to be overhead costs. He adds them together and multiplies them by a factor in order to get the projected overhead costs for the new year. This factor is based on inflation and trends in the industry that might cause costs to fluctuate. He then sends this total projected overhead cost to

the production department where they allocate to each part by weight and usage estimates (Burgess).

These three costs form the most important report that Ford uses which is the cost and price report. An example of the cost and price report is provided in Appendix C of this paper. The report lists the products name along with the three cost elements associated with it in columns. There is a total cost column in the report that represents the addition of the three costs. The last two columns of the report are the markup and total price columns. The markup and price amounts are figured based on what the customer will accept. If a new product is created, it is added to this report and any costs that can not be figured due to lack of data are estimated based on similar products. This report is updated whenever new products are added or if major price changes come about (Burgess).

Another report that managers at Ford use is the piecerate summary sheet. Each one of the workers fills out a piecerate sheet which is a record of the amount of parts that are made along with the dollar rates per part. This sheet is entered into the payroll computer so that paychecks can be printed out along with the piecerate report. This report gives the production department an idea of how many people are meeting the rate standards. If rates are not met on a certain part for a period of time, the production department is alerted of this by the report. Sometimes the parts per hour rate is too high for a part and must be adjusted by the department (Burgess).

Ford has two reports that deal with the brass used in the product. Since brass is a major input, it is important to know the accurate price paid per pound of brass purchased. A brass purchased report is produced which lists the amount of brass purchased and the price each quantity was purchased at. An example of the layout of this report is given in Appendix C of this

paper. This report serves as a record of the prices at which each shipment of brass was bought. In addition, it gives Ford a record of the amount of brass they should have on hand when matching it to the brass used report. The last part of the brass purchased report is the calculation of a weighted average cost for brass purchases. This is the number that is used to figure the brass cost on the first report in this section (Sare).

The other report that deals with brass is the brass used report which measures the amount of brass used in any period. The report is a compilation of the amounts of brass poured per month by the foundry minus any scrap that ends up back at the foundry for the period. This gives Ford an estimate of how much brass was used per month (Sare).

Ford uses another report to generate a figure known as "internal income." Internal income is basically a contribution margin figure. The report is a summary of the number of all of the products shipped divided into the total dollar value (markup included) of the products shipped. This is done for each product on the report and a combined estimate is generated at the bottom of the report. This estimate minus the cost per part figure is the estimated income per part. For example, Ford sells ten parts for one-hundred and fifty dollars and the cost from the cost and price report is listed at ten dollars per part. Thus, the internal income figure for that product then is five dollars per part ($\$150/10 \text{ parts} = \$15 \text{ dollars per part (price)} - \$10 \text{ dollars per part (cost)} = \$5 \text{ dollars per part internal income}$). Mr. Burgess stated that this cost is not completely accurate, but it is close enough to monitor trends in cost (Burgess).

The only report that is used by the lower level managers is the inventory report. The inventory report is available on computer in each department and is updated as parts are received and shipped by the shipping department. The report contains the part name, part number, and the

quantity of that part stored in the shipping department. If a negative number shows up on this report in the quantity column, it means that more of this part has been sold than is on hand in the shipping department. This report gives the supervisor an idea of what parts should have production priority and which ones do not (Elliott).

These internal reports generated by Ford Meter Box are generated on a monthly basis, except when stated otherwise. Together, these reports are the link between management and the production floor. Without them, the managers at Ford would be unable to make necessary adjustments to the production process.

LINKING THE REPORTS WITH CRITICAL SUCCESS FACTORS

When comparing the Critical Success Factors to the internal management reports, most of the CSFs are covered in some way or another in the reports. Of the five Critical Success Factors listed in the paper, two of them are indirectly covered by the internal reports of the company. For the most part, the internal management reports of Ford Meter Box can be correlated to the Critical Success Factors of the company. Please see the chart in Appendix D of this paper relating to the linking of Critical Success Factors with Ford's internal reports.

The cost and price report directly relates to the Critical Success Factor dealing with keeping raw materials prices to a minimum. The report is a listing of the cost inputs, which include the raw materials used in the product. This report can be compared with past price and cost reports to show fluctuations in the cost of raw materials. For example, when looking at a report from two months ago and one today, the managers at Ford Meter Box could see if certain elements in the price of the product changed from period to period. If the labor element was different between the two reports, this could alert management to problems in making the product such as slacking workers or worn out machinery. This report is important to the success of the company because it contains the price of every product produced by Ford with the markup demanded by management. Without this report, Ford would not have a way to see if they were able to make a profit on the sale of the product.

The piecerate summary report does not have a CSF match, but it is important because its information supports the cost and price report. The piecerate summary report is the data set that is used to make changes to part labor rates. If the part labor rate is changed by the production department, then the labor cost column in the cost and price report will change also. This report

does not match any of the Critical Success Factors, but still needs to be a part of the reporting procedure at Ford because of its relevance to the cost and price report.

The brass purchase and used reports support two Critical Success Factors. The reports provide information on brass costs which are key to keeping raw materials costs to a minimum. At any given time, a cost can be computed for the brass that is on hand. This price can be compared to the market price of brass in order to make future purchasing decisions. The two reports also support raw materials and finished goods inventory maintenance by providing Ford with the amount of brass that is on hand. This information gives the purchasing department an idea of when to purchase more brass. If this information was not provided to the managers at Ford, they might overpurchase brass at a higher price than what it could be bought at later.

The inventory report used by the low level supervisors also supports the Critical Success Factor dealing with raw materials and finished goods inventory maintenance. The inventory reports tells how much of each item is in the shipping department warehouse. This gives the supervisor an idea of what parts need to be produced. If Ford did not have an inventory report, it would not know how much of each item to produce in order to fill orders. If Ford underproduced a certain product, it might not be able to meet the demand of customers. Yet, if it overproduced the certain product, it would face costs of holding the excess inventory. Ford wants a certain amount of excess inventory of standard products so that it can meet special orders, but at some point, the costs of holding the excess inventory outweigh the advantages..

The internal income report does not match up with any of the Critical Success Factors. It is a report that contains "after the fact" information. This information is produced to look at the overall transaction of making and selling the product in a retrospective fashion. This information

is produced too late to make adjustments in the production process. The report does not match any of the Critical Success Factors, so it does not seem to be necessary to the future success of the company. The company feels it needs the report to monitor trends in cost, but it already has a report that does this. The internal income report is not necessary because of this. It is nothing more than an income statement used for the purpose of management.

By linking the internal reports to the Critical Success Factor at Ford, most of the reports are covered by one or more CSFs. Ford should keep on producing these reports for the use of management. The internal income report is the only one that should be eliminated because it only repeats what another report does. The problem that Ford has is in linking three of the Critical Success Factors with a report. The three factors that were not matched with a report are: product quality, customer service, and adequate scheduling for different jobs. Ford has not provided a way to monitor these Critical Success Factors, thus, it has left itself vulnerable in these areas. If Ford is to continue to be successful as a company, it needs to find a way to monitor these Critical Success Factors.

REPORT COMMENTS AND SUGGESTIONS

The last part of this paper deals with comments on the reports made by managers and suggestions for improvement. When asked about the reports they use, the three managers all thought they were adequate. Paul Sare made the comment that "reports are not a fun thing to work with, but they are necessary as feedback on what we do." The consensus of the group was that Ford's reports do what they are supposed to do.

Tim Burgess talked about his impression of the reports and the system at Ford Meter Box. He talked about having the lack of a formal cost accounting system which he had experienced at other companies he worked for. He said, "Nobody at either of these places (the places with the formal cost accounting systems) had their 'arms around' the entire system. The management reporting was inadequate to make realistic production decisions." His recollection of a formal cost accounting system is filing cabinets full of computer printouts of standard costing variances. He is very headstrong about not going to a system like this unless he has to. He believes that a formal cost accounting system would not guarantee that they could manage things better, so why change a process that has worked for forty some years (Burgess).

It is true that Ford Meter Box has been a successful company for many years. One has to ask the question--do we mess with success or do we change things in order to make them better and risk messing up? Ford needs to look at ways to become more cost conscious if the market starts to tighten up. For example, Ford may want to look at ways to improve their cost accounting system. Maybe they can find a computer program that will help them take some of those overhead costs and directly relate them to the individual product.

Ford can also make some changes to their internal reports in order to better match them with the Critical Success Factors of the company. Ford should come up with reports to cover the three Critical Success Factors that did not have corresponding reports (The three were product quality, customer service, and adequate scheduling for different jobs). The inventory report allows most of the departments to do this without any problem. This is not the case with the machine department because it deals with too many parts. The wall full of note cards is the way jobs are being scheduled in the machine department now. This causes confusion sometimes and takes lots of time to come up with the schedule. Ford could reduce this time and trouble by using a computer to generate a scheduling report for the machine shop.

Ford also needs to generate a report to monitor product quality. This might be difficult to do internally because quality is left up to the individual worker, not a quality control department. Workers are trained to check certain aspects of the product in order to detect defects. They do not record these defects, instead they set the product aside where it is either scraped or repaired. Ford needs to come up with a report that is a record of all defective products. Along with the internal checking of defects, it should also produce a report on product sent back to the company by customers. Right now, middle and upper management is not aware of product being sent back to the company by customers unless it is a large amount for a single customer.

The last Critical Success Factor without an internal report is customer service. In order to monitor customer service, customers should be encouraged to fill out comment sheets on each customer service representative and salesperson. They should also be encouraged to contact the head of the sales department in order to make suggestions or voice complaints. The head of this

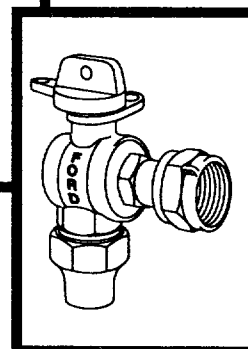
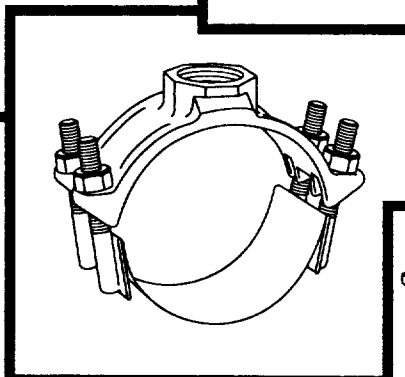
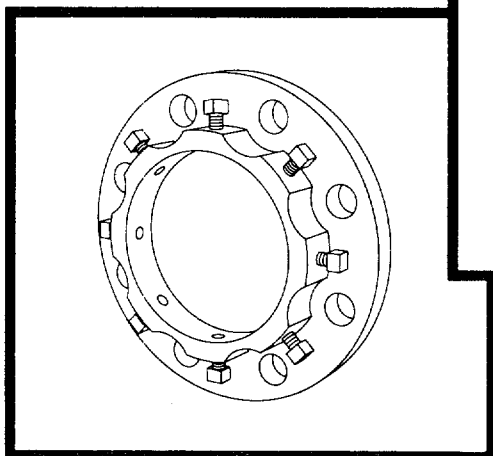
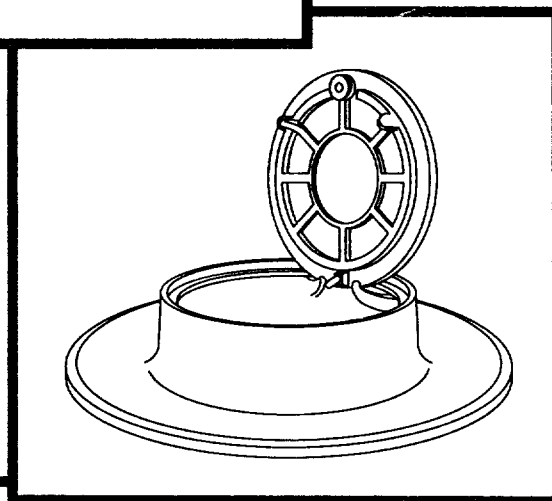
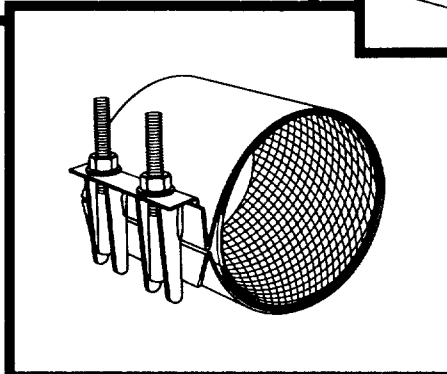
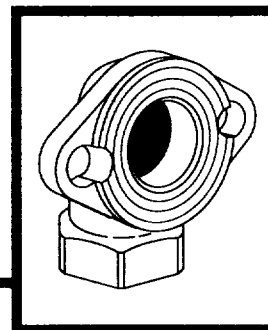
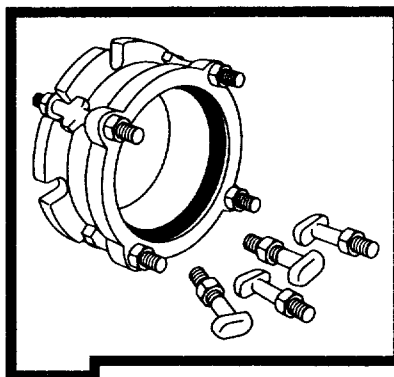
department can produce a report using this information. This way, each employee can be monitored for his or her effectiveness.

The last suggestion has to do with the technology being used at the company. The main computer used to generate most of the internal reports is about fifteen years old that most of the internal reports are generated with. Some reports are done on personal computers, but all of them rely on information from the main computer. In the past couple of months, the main computer has failed six times. This does not count the many errors that are sometimes found in the information. Ford could probably improve its reports simply by getting a new computer and modern software. Regardless of improvement, a new computer must be kept in mind in case of total failure.

Appendix A
Product Guide

Ford Product Guide

This guide shows Ford Meter Box product categories by catalog section. For complete product information please refer to the *specific* catalog section referenced in this guide.



The Ford Meter Box Company, Inc. P.O. Box 443, Wabash, Indiana, USA 46992-0443

Telephone: 219-563-3171 / FAX: 800-826-3487 / Overseas FAX: 219-563-0167

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CATALOG SECTION	PRODUCT CATEGORY	PAGE NUMBER
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AA	SERVICE SADDLES AND TAPPING SLEEVES	4 & 5
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B	INSIDE METER SETTINGS	7
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I	CHECK VALVES AND RETROSETTERS	18
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N	FABRICATED STEEL PRODUCTS	23
Uni-Flange	ADAPTER FLANGES AND RESTRAINERS.	24, 25 & 26

CORPORATION STOPS AND BALLCORPS™

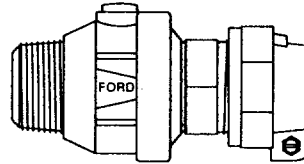
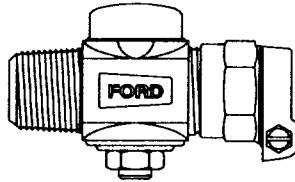
CATALOG SECTION A

Ford Meter Box offers the largest variety of service line connections including male & female iron pipe thread, flare copper, compression couplings for copper, iron, polyethylene, PVC and lead. All Ford brass products are made to the AWWA standard of 85-5-5-5 brass.

Grip Joint Nuts are available for 3/4" through 2" CTS and 3/4" and 1" PE Pipe.

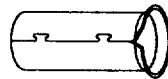
CORPORATION STOPS

Key Valve Corp

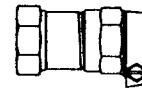
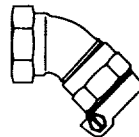
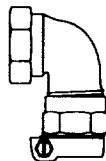


Ball Valve Corp
BallCorp™

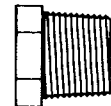
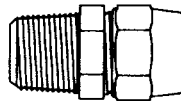
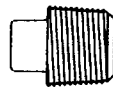
INSERT STIFFENERS FOR PE PIPE OR TUBING



QUARTER BENDS, EIGHTH BENDS , AND STRAIGHT COUPLINGS



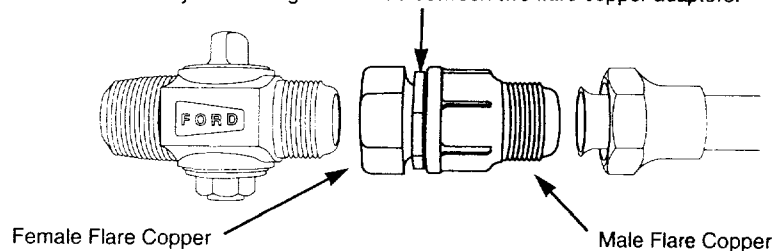
REPLACEMENT PIECES, BRASS CORP STOP PLUGS AND BRASS BUSHINGS FOR CORPORATION STOPS



Corp Stop Replacement Piece
with Grip Joint Nut outlet

SERVICE INSULATORS

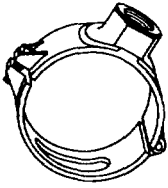
Threaded nylon bushing assembled between two flare copper adapters.



SERVICE SADDLES AND TAPPING SLEEVES

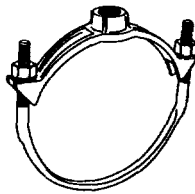
CATALOG SECTION AA

BRASS SADDLES

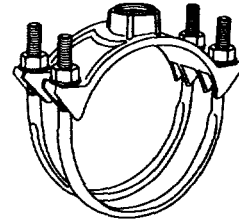


Style S70 and S71
Saddles for Standard PVC Pipe

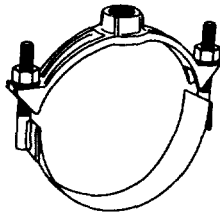
Style S90 and S91
Saddles for C900 PVC Pipe



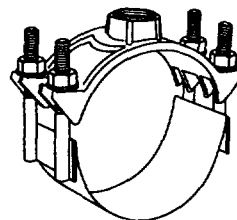
Style 101B
Single Strap Saddle



Style 202B
Double Strap Saddles

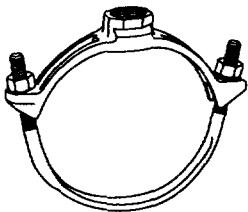


Style 101BS
Single Band Saddles with
stainless steel bands &
bolts for C900 PVC pipe

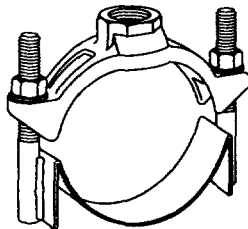


Style 202BS
Double Band Saddles with
stainless steel bands &
bolts for C900 PVC pipe

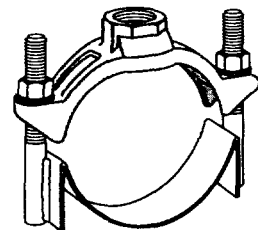
IRON SERVICE SADDLES



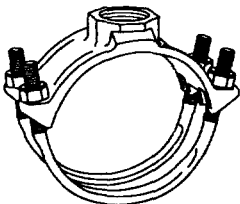
Style F101
(with standard steel strap)



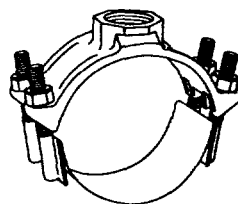
Style FS101
(with Stainless Steel
Band and Bolts)



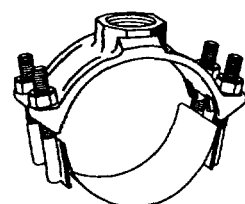
Style FC101
(Epoxy Coated with
Stainless Steel Band
and Bolts)



Style F202
Double Strap Saddles - (with
standard steel straps)



Style FS202
Double band Saddles
(with Stainless Steel
Band and Bolts)

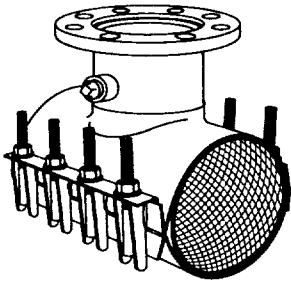


Style FC202
Double band Saddles
(Epoxy Coated, with Stainless
Steel Band and Bolts)

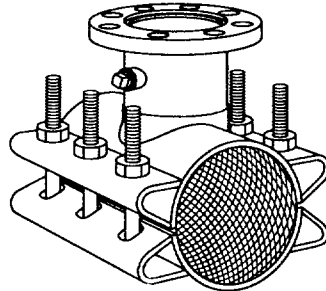
SERVICE SADDLES AND TAPPING SLEEVES

CATALOG SECTION AA

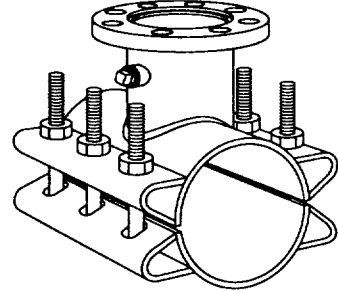
TAPPING SLEEVES



All Stainless Steel Tapping Sleeve
Style FAST Tapping Sleeves with
Stainless Steel or Carbon Steel Flange

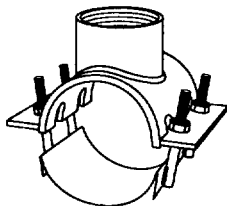


All Stainless Steel Tapping Sleeve
With removable bolts and 360° gasket
Style FTSS Tapping Sleeves with
Stainless Steel or Carbon Steel Flange



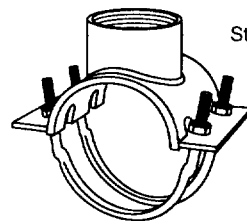
Steel Tapping Sleeve
Style FTS Tapping Sleeves
Style FTSC Epoxy Coated
Tapping Sleeves

FABRICATED STEEL SERVICE SADDLES FOR 3" & 4" TAPS



Style FS202

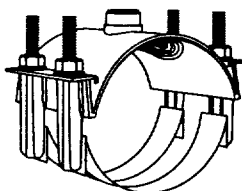
with stainless steel band



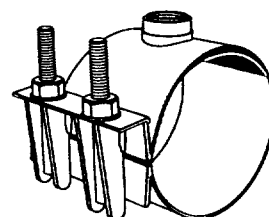
Style F202

with standard steel straps

STYLE FRS202 DOUBLE BAND STAINLESS REPAIR SADDLES



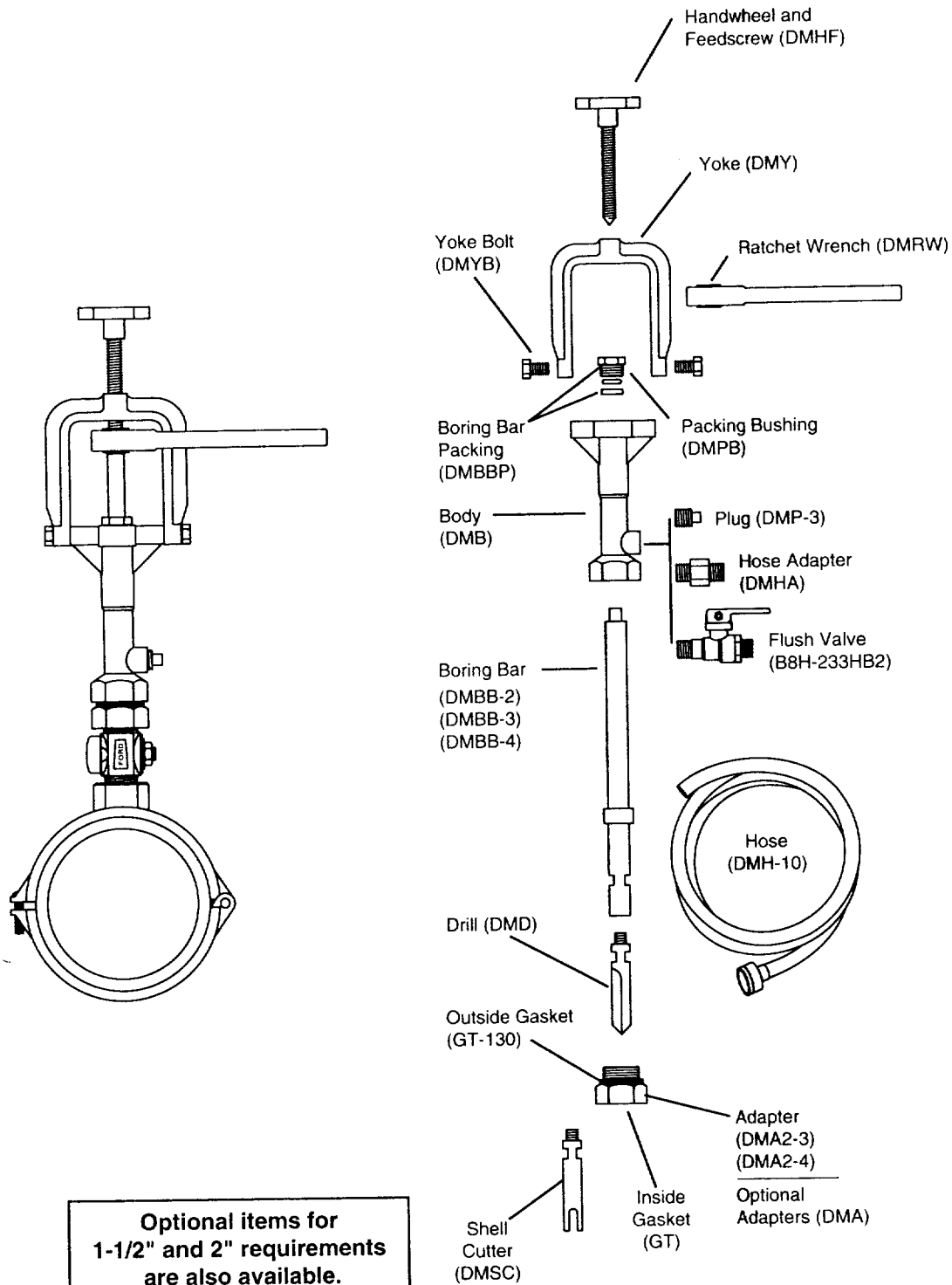
STYLE FS303 STAINLESS STEEL SADDLES FOR PVC PIPE



DRILLING MACHINE

CATALOG SECTION AB

DRILLING MACHINE KITS

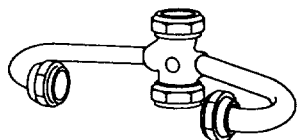


INSIDE METER SETTINGS

CATALOG SECTION B

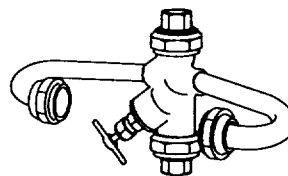
COPPERHORNS

For metering new services



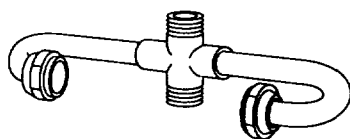
VALVE COPPERHORNS

For metering new services



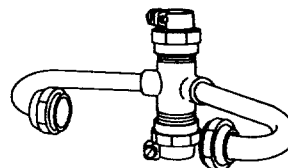
PLUMBHORNS

For metering new services



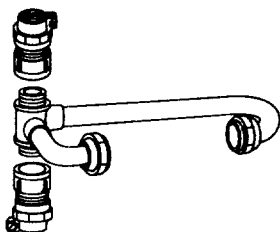
HANDYHORNS

For metering new or existing services
(setters with integral inlet - outlet
Pack Joint connections)



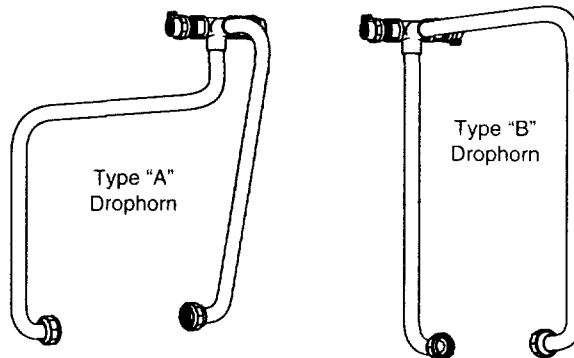
KORNERHORNS

For metering existing services
(setters with removable & interchangeable valves
and Pack Joint connections)



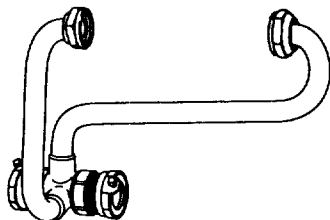
DROPHORNS

For metering existing services
(setters with removable & interchangeable valves
and Pack Joint connections)



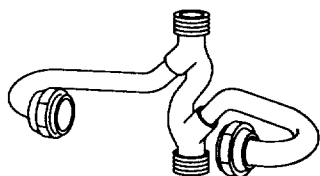
PRETZELHORNS

For metering existing services
(setters with removable & interchangeable valves
and Pack Joint connections)



BASEMENT RESETTERS

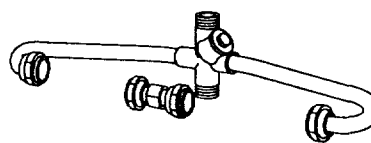
For existing meter services



WALL SETTERS / TANDEM

INDOOR SETTINGS

For special metering applications

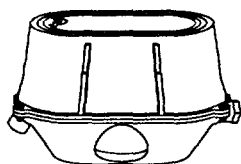


METER BOXES

CATALOG SECTION C

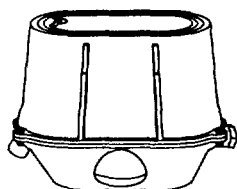
YOKEBOXES FOR 5/8" AND 5/8 x 3/4" METER

Yokeboxes are available with a variety of options and configurations including a straight or angle inlet. Inlet Ball Valves and outlet cartridge dual check valves are also available.



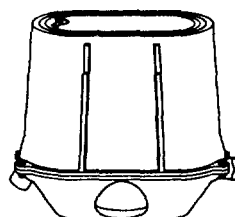
EXTRA SHALLOW TYPE

for modern magnetic or multi-jet meters
(center line of meter
5" below grade)



SHALLOW TYPE

(center line of meter
8" below grade)



DEEP TYPE

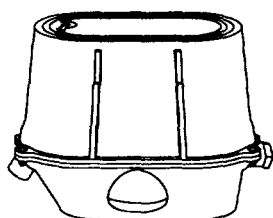
(center line of meter
10" below grade)



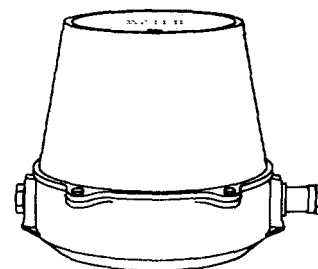
LONG YOKEBOX (SHALLOW)

(with a cartridge dual check valve
included located completely within
the Yokebox)

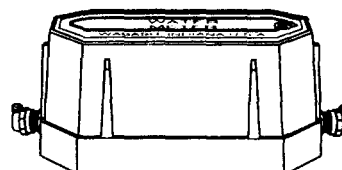
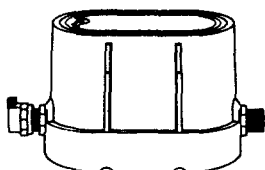
YOKEBOXES FOR 3/4" METER



YOKEBOXES FOR 1" METER

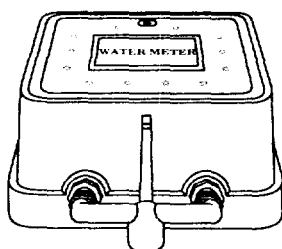


GULFBOXES FOR 5/8" AND 5/8" x 3/4" METER

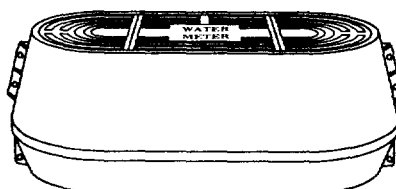


"Long Gulfboxes" are available
for use when a cartridge dual
check valve is required.

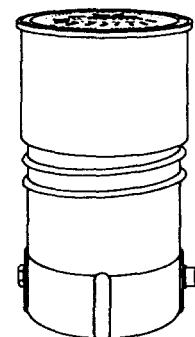
DOUBLE GULFBOXES for 5/8" and 5/8 x 3/4" meters



PROTECTOR METER BOXES For 1-1/2" & 2" Meters



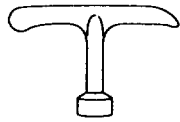
CRESCENT BOXES Grade Adjustable boxes for 5/8", 5/8" x 3/4", 3/4" & 1" meters



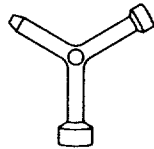
METER BOX COVERS

CATALOG SECTION D

KEYS FOR COVERS AND VALVES, WORM LOCK PARTS, INSULATING BLANKETS AND DISKS



Key Nos. 1 & 1-B



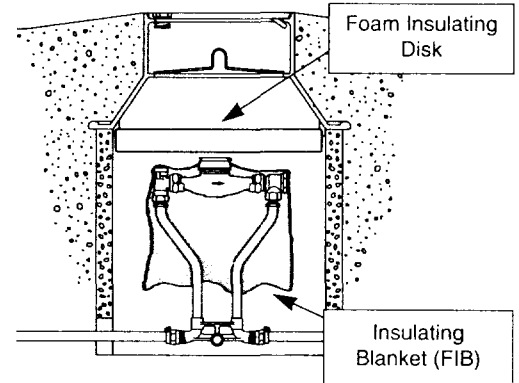
Key No. 2



Key No. 3

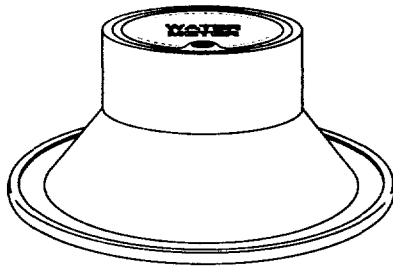


Key No. 4



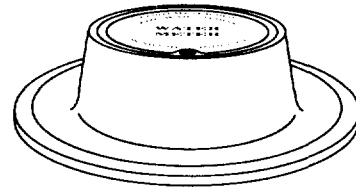
WABASH DOUBLE LID COVERS

Inset Style Top Lid Plus Inner Lid
for Frost Protection, 10" cover depth



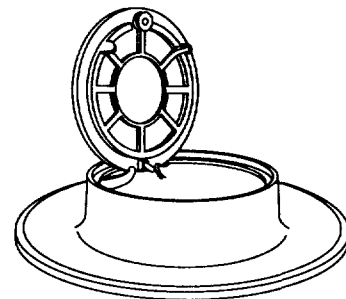
TYPE "A" SINGLE LID COVERS

Inset Style Top Lid, 4" cover depth



TYPE "X" SINGLE LID COVERS

Overlapping Style Top Lid with Hinged
Lid Support on Frame, 4" Cover depth



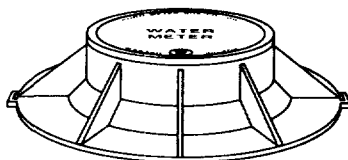
TYPE "C" SINGLE LID COVERS

Overlapping Style Top Lid, 4" cover depth



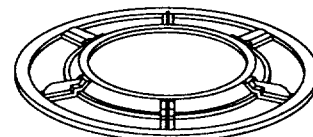
PMBC-3 PLASTIC SINGLE LID COVER

Overlapping Style Top Lid, 4" cover depth



EXTENSION RINGS

For Wabash, A, C, or X type Covers

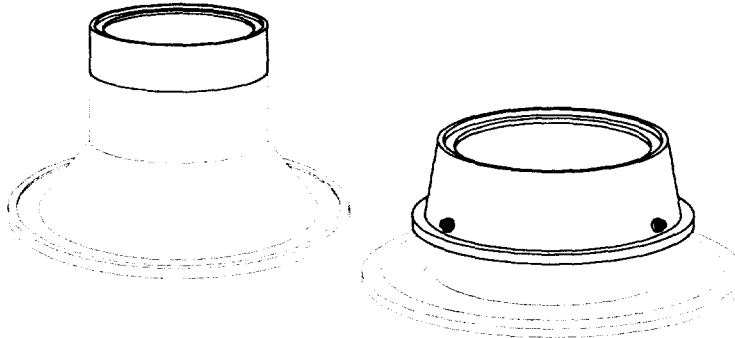


METER BOX COVERS - *CONTINUED*

CATALOG SECTION D

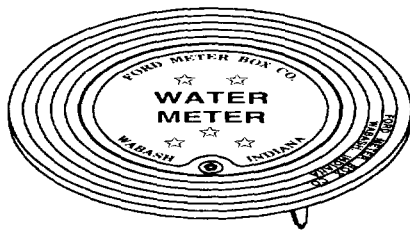
ELEVATOR RINGS

For Wabash and A or C and X type Covers



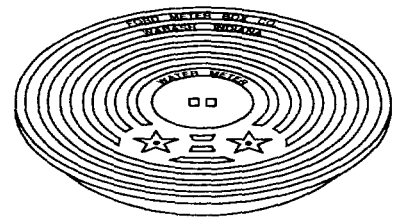
FLAT METER BOX COVERS

Type "KA" Flat Covers with Inset Style Lids



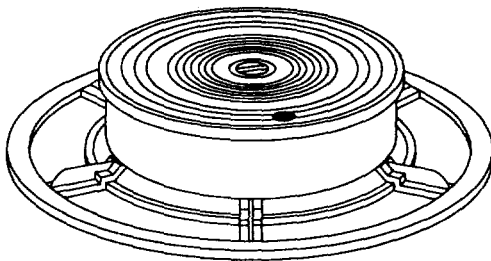
ONE PIECE FLAT COVERS

(No Separate Top Lid)



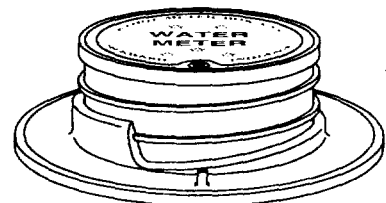
MONITOR COVERS

For Large Settings

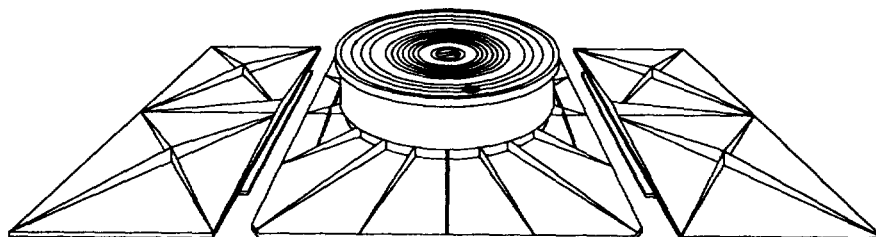


ADJUSTABLE COVER

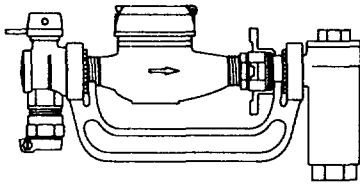
Inset Style Top Lid with Adjustable Frame
Height, 3-1/4" - 6-1/2" cover depth



RECTANGULAR METER PIT COVERS

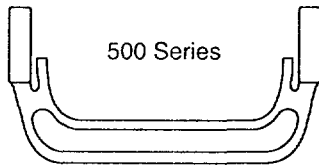


METER YOKES CATALOG SECTION E

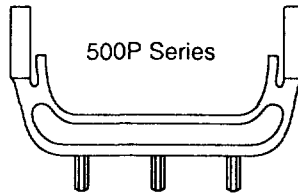


Example of a complete Yoke meter setting using a 500 series Yoke bar, an angle ball inlet valve, standard expansion connection, and an angle cartridge dual check outlet valve.

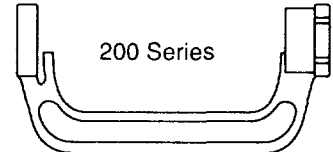
IRON YOKE BARS



500 Series

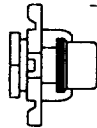


500P Series



200 Series

YOKE EXPANSION CONNECTIONS



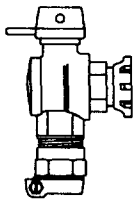
Standard



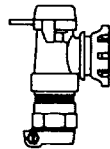
Wrench Type

INLET VALVES FOR YOKES

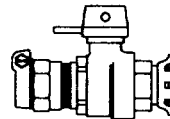
ANGLE BALL, ANGLE KEY, STRAIGHT BALL AND STRAIGHT COMPRESSION VALVES



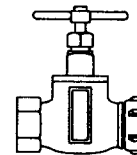
Angle Ball Valve



Angle Key Valve



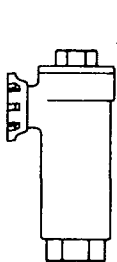
Straight Ball Valve



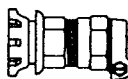
Straight Compression Valve

OUTLET PIECES AND CHECK VALVES FOR YOKES

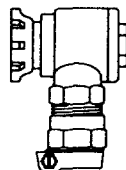
STRAIGHT, ELL, STRAIGHT CARTRIDGE DUAL CHECK, ANGLE CARTRIDGE DUAL CHECK, ANGLE DUAL CHECK, ANGLE SINGLE CHECK, STRAIGHT DUAL CHECK AND STRAIGHT SINGLE CHECK



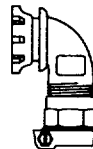
Angle Cartridge Dual Check Valve



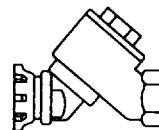
Straight Outlet Pieces



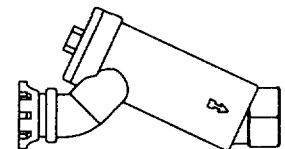
Angle Check Valve



Ells

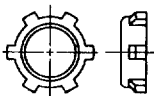


Straight Check Valve



Straight Cartridge Dual Check Valve

LOCK NUTS, LOCK CAPS, WRENCHES, GASKETS & SPECIAL PARTS



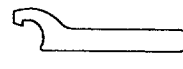
Lock Nuts



Gaskets



Lock Caps



Spanner Wrench



Expansion Connection Wrench

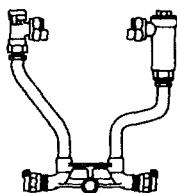
COPPERSETTERS, LINESETTERS AND RESETTERS

CATALOG SECTION F

COPPERSETTERS

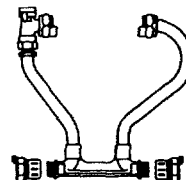
70 SERIES COPPERSETTERS

for 5/8", 5/8" x 3/4", 3/4" & 1" meters



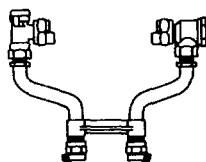
270 SERIES COPPERSETTERS

with removable Pack Joint assemblies
for 5/8", 5/8" x 3/4", 3/4" & 1" meters



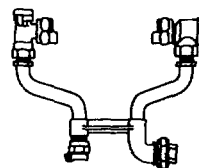
80 SERIES COPPERSETTERS

with vertical inlet and outlet
for 5/8", 5/8" x 3/4", 3/4" & 1" meters



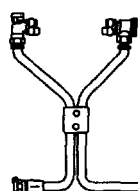
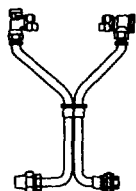
70-80 SERIES COPPERSETTERS

with vertical inlet and horizontal outlet
for 5/8", 5/8" x 3/4", 3/4" & 1" meters



90 SERIES COPPERSETTERS

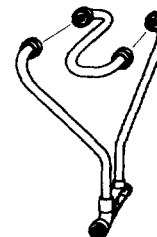
for 5/8", 5/8" x 3/4", 3/4" & 1" meters



Optional outlet tube
extension and bolted
clamp construction
available.

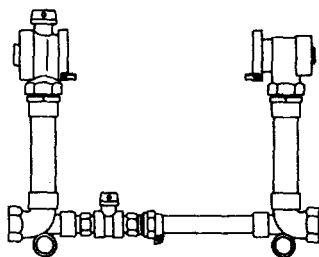
TANDEM COPPERSETTERS & RESETTERS

for 5/8", 5/8" x 3/4", 3/4" & 1" meters



1-1/2" AND 2" COPPERSETTERS

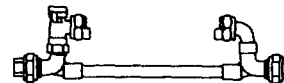
for 1-1/2" and 2" flanged meters



Shown with Standard By-Pass.
Optional High By-Pass is available.

LINESETTERS

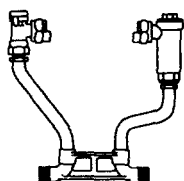
for 5/8", 5/8" x 3/4", 3/4" & 1" meters



RESETTERS - FOR RESETTING METER IN AN EXISTING SERVICE

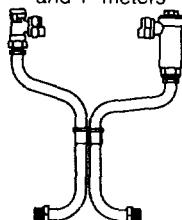
40 SERIES RESETTER

for 5/8", 5/8" x 3/4", 3/4"
and 1" meters



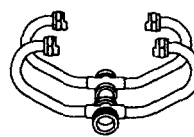
30 SERIES "FLEXIBLE" RESETTER

for 5/8", 5/8" x 3/4", 3/4"
and 1" meters



TANDEM RESETTER

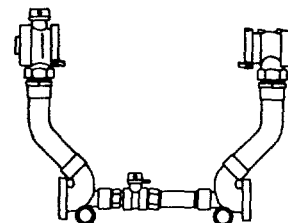
for 5/8", 5/8" x 3/4", 3/4"
and 1" meters



B Style Tandem
Resetter

1-1/2" & 2" RESETTER

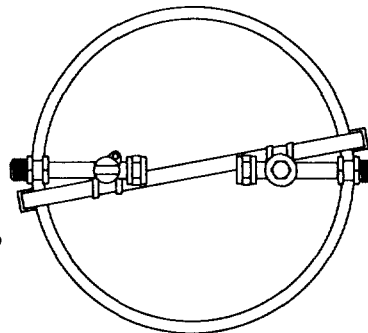
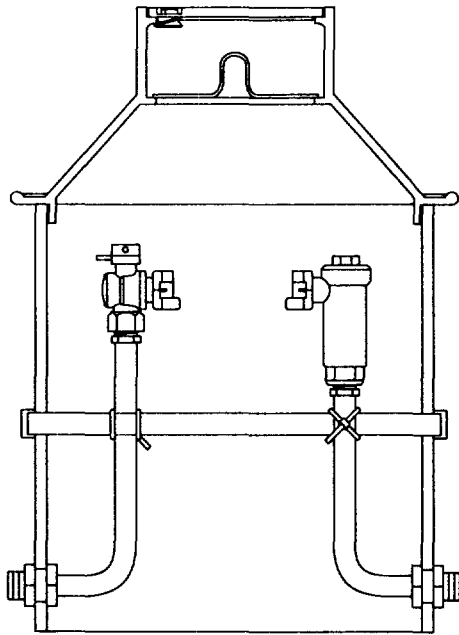
for flanged meters



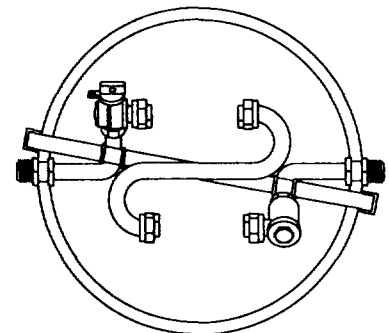
PLASTIC PIT SETTERS

CATALOG SECTION FA

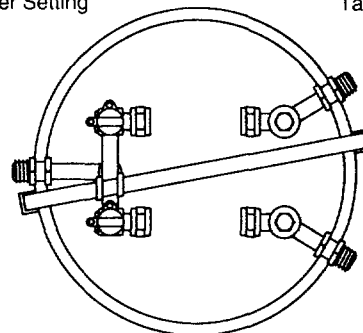
PIT SETTER FOR 5/8", 5/8" x 3/4", 3/4" & 1" METER



Single Meter Setting



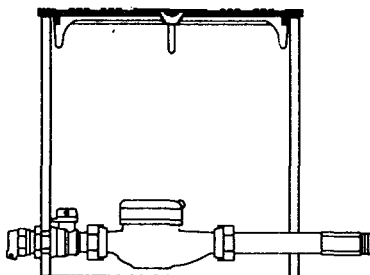
Tandem Setting



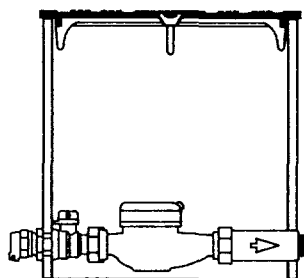
Dual Setting

15" DIAMETER STYLE "K" PITSETTER

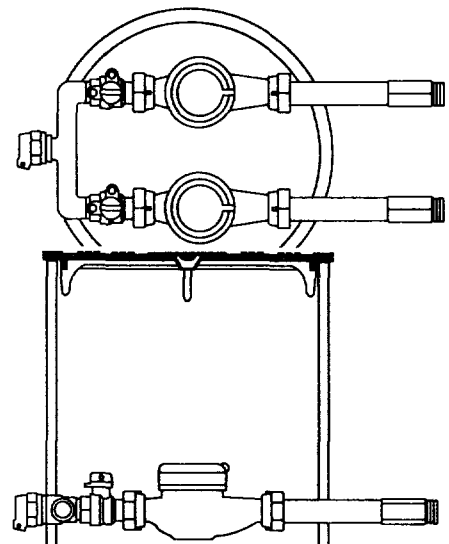
For 5/8" x 3/4" Meters
(For Moderate Climates)



Standard Setting



with Cartridge Dual
Check Valve

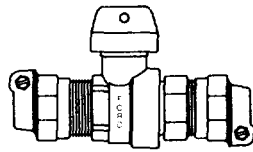


For Dual 5/8" x 3/4"
Meter Setting

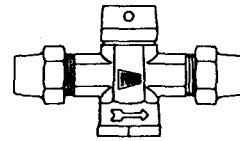
VALVES

CATALOG SECTION G

CURB STOPS

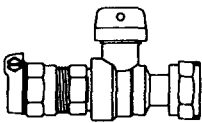


Ball Valve Curb Stops

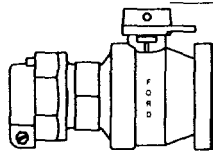


Inverted Key Curb Stops

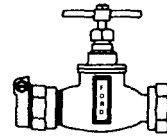
STRAIGHT METER VALVES



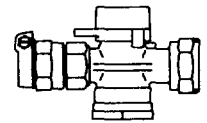
Ball Valves



1-1/2" & 2" Flanged
Ball Valves

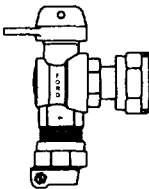


Compression Valves

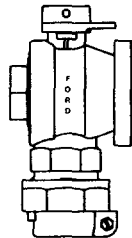


Inverted Key Valves

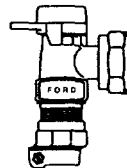
ANGLE METER VALVES



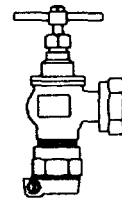
Ball Valves



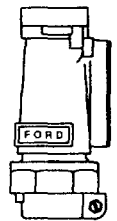
1-1/2" & 2" Flanged
Ball Valves



Key Valves



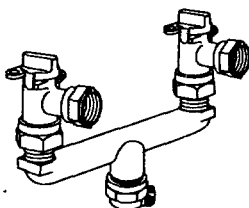
Compression Valves



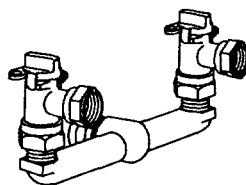
1-1/2" & 2" Flanged
Key Valves

BRANCH ASSEMBLIES & ANGLE BRANCH ASSEMBLIES

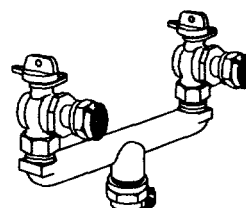
6-1/2" & 7-1/2" Spacing Between Centers of Valves



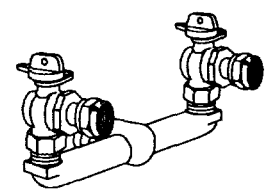
Branch Assembly
with Key Valves



Angle Branch Assembly
with Key Valves



Branch Assembly
with Ball Valves

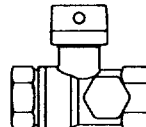
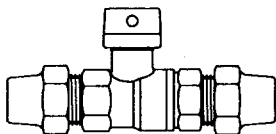


Angle Branch Assembly
with Ball Valves

VALVES

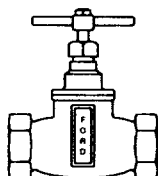
CATALOG SECTION G

5/8" STRAIGHT BALL SERVICE VALVES

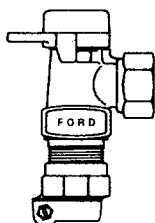


(some valves available with
drain/test valve on outlet side
of valves)

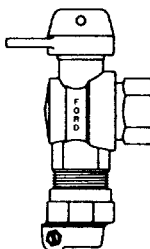
3/4" STRAIGHT COMPRESSION GLOBE SERVICE VALVES



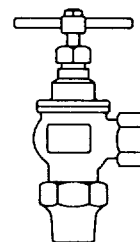
ANGLE SERVICE VALVES



Inverted Key Valves



Ball Valves



Compression Valves

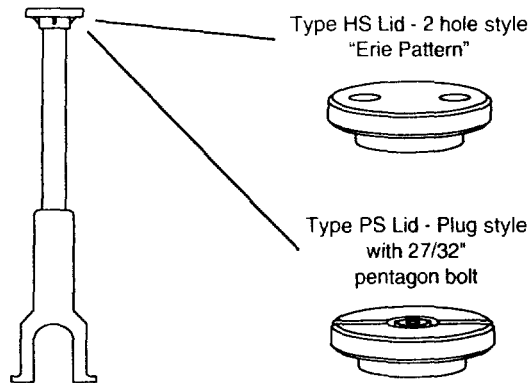
FORD METER BOX OFFERS A VARIETY OF VALVE OPTIONS.

1. Pad Lock Wings are available to allow locking valves in the closed position.
2. Curb Stops are available with a Minneapolis Pattern for threaded Curb Boxes.
3. Many Ball valves are available with 360° Tee head Rotation Option.
4. Selected Ford Valves are available with SPECIAL "New England" Iron Pipe Threads under Flare Nut.
5. Valves can be manufactured so the valve opens by turning the handle to the right or clockwise.
6. Valve handles are available for a variety of valves.
7. Lock caps for ball and key valves are available.
8. A gate valve operating nut is available.

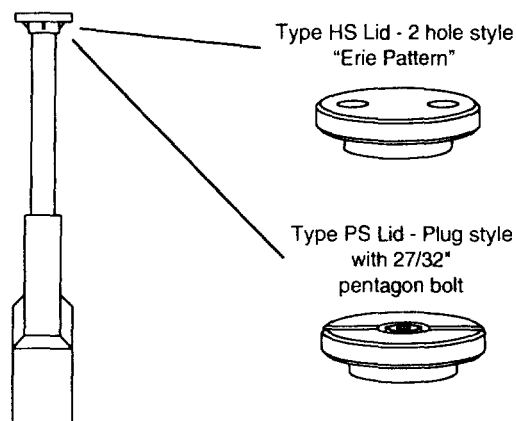
METER BOX CURB BOXES

SECTION GA

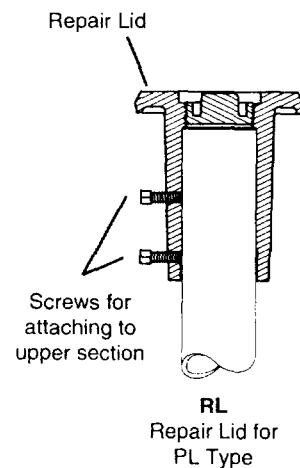
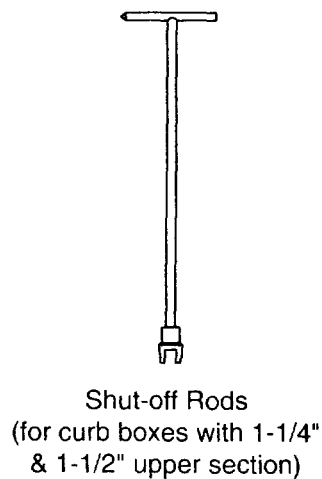
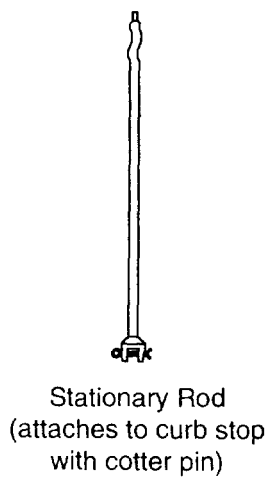
ARCH PATTERN CURB BOXES



MINNEAPOLIS PATTERN CURB BOXES



STATIONARY RODS, SHUT-OFF RODS AND PARTS FOR CURB BOXES



METER COUPLINGS AND ACCESSORIES

SECTION H

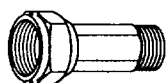
METER GASKETS



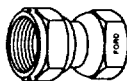
METER COUPLING NUTS



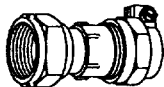
STRAIGHT METER COUPLINGS



MIP

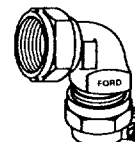


FIP

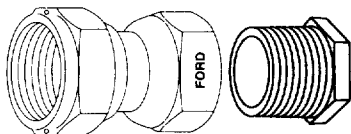


COMPRESSION

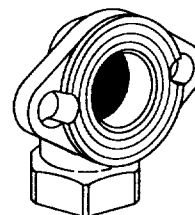
ANGLE METER COUPLINGS



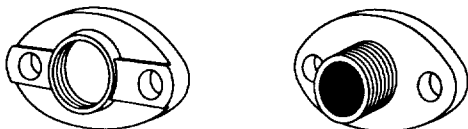
DIELECTRIC BUSHINGS (FOR INSULATING SERVICE LINES)



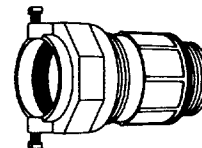
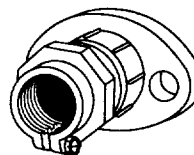
FLANGE ELLS FOR 1-1/2" AND 2" METERS



BRONZE METER FLANGES



LOK-PAK METER COUPLINGS FOR 1-1/2" AND 2" METERS



METER ADAPTERS



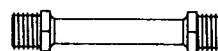
Adapt from 1" to 2"
meter with A47 Adapter



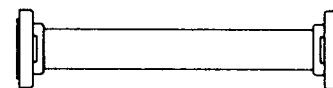
Adapt from 1" to 5/8"
meter with A14 Adapter

A VARIETY OF OTHER ADAPTERS ARE AVAILABLE

METER IDLERS

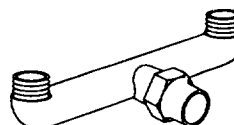
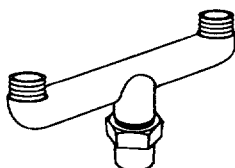


for 5/8" thru 1" meters



for 1-1/2" thru 2" meters

"U" BRANCH PIECES



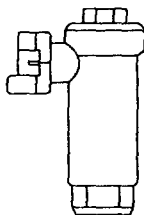
CHECK VALVES, RETROSETTERS AND CUT-IN CHECK VALVES

CATALOG SECTION I

ANGLE CARTRIDGE STYLE DUAL CHECK VALVES

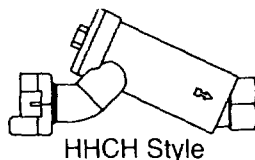
(In-Line Accessible)

U.S. Pat. No. 5148828



STRAIGHT CARTRIDGE STYLE DUAL CHECK VALVES

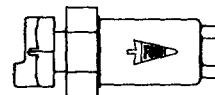
(In-Line Accessible)



HHCH Style

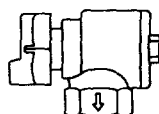
STRAIGHT CARTRIDGE STYLE DUAL CHECK VALVES

(Not In-Line Accessible)



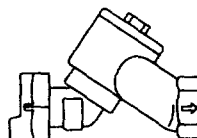
ANGLE CASCADING DUAL CHECK VALVES

(In-Line Accessible)



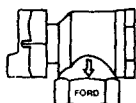
STRAIGHT CASCADING DUAL CHECK VALVES

(In-Line Accessible)



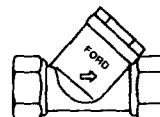
ANGLE CHECK VALVES

(In-Line Accessible)



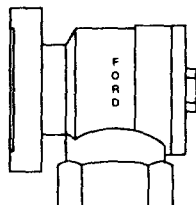
STRAIGHT CHECK VALVES

(In-Line Accessible)

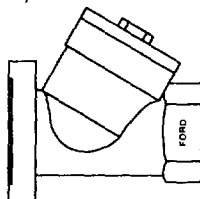


SINGLE CHECK VALVES WITH FLANGED INLET FOR 1-1/2" AND 2" METERS

(In-Line Accessible)



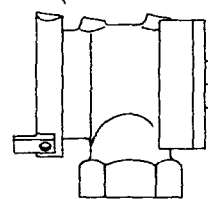
Angle
Check
Valves



Straight
Check
Valves

DUAL CHECK VALVES WITH FLANGED INLET FOR 1-1/2" AND 2" METERS

(In-Line Accessible)



Angle
Check
Valves

CHECK VALVES FOR KORNERHORN & SPECIAL APPLICATIONS

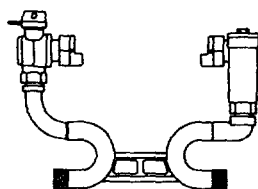
CHECK VALVE REPAIR KITS - INTERNAL WORKING PARTS AND GASKETS

CUT-IN CHECK VALVE ASSEMBLIES FOR FORD COPPERSETTERS AND RESETTERS

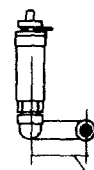
(With "HA" & "HHA" Style Check Valves)

RETROSETTERS

FOR RETRO-FITTING CHECK VALVES INTO AN EXISTING METER SERVICE



Style "B"



Style "C"

Offset

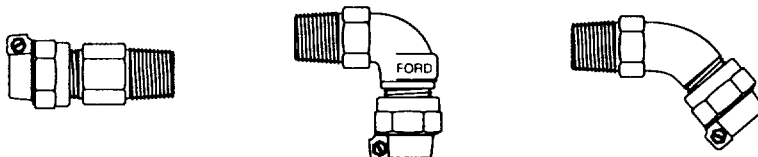
COUPLINGS FOR PIPE AND TUBING

SECTION J

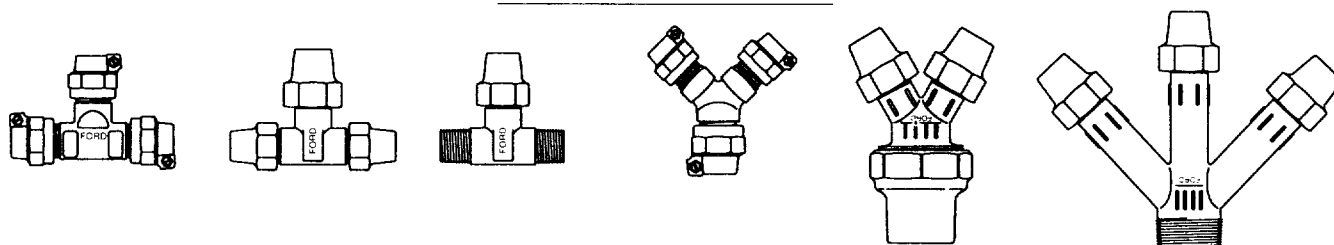
Ford Meter Box offers the largest variety of couplings in the water works industry including male & female iron pipe thread, flare copper, compression couplings for copper, iron, polyethylene, PVC and lead. All Ford brass products are made to AWWA standard of 85-5-5 brass.

Grip Joint Nuts are available for 3/4" through 2" CTS and 3/4" and 1" PE Pipe.

STRAIGHT COUPLINGS, ELLS AND EIGHTH BENDS



TEES AND "Y" BRANCHES

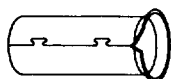


LEAD-PAK COUPLINGS

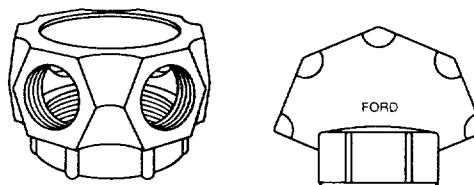
For joining various types of service line material to lead



INSERT STIFFENERS FOR PE PIPE OR TUBING



MULTI-SERVICE TEES AND "Y"'S

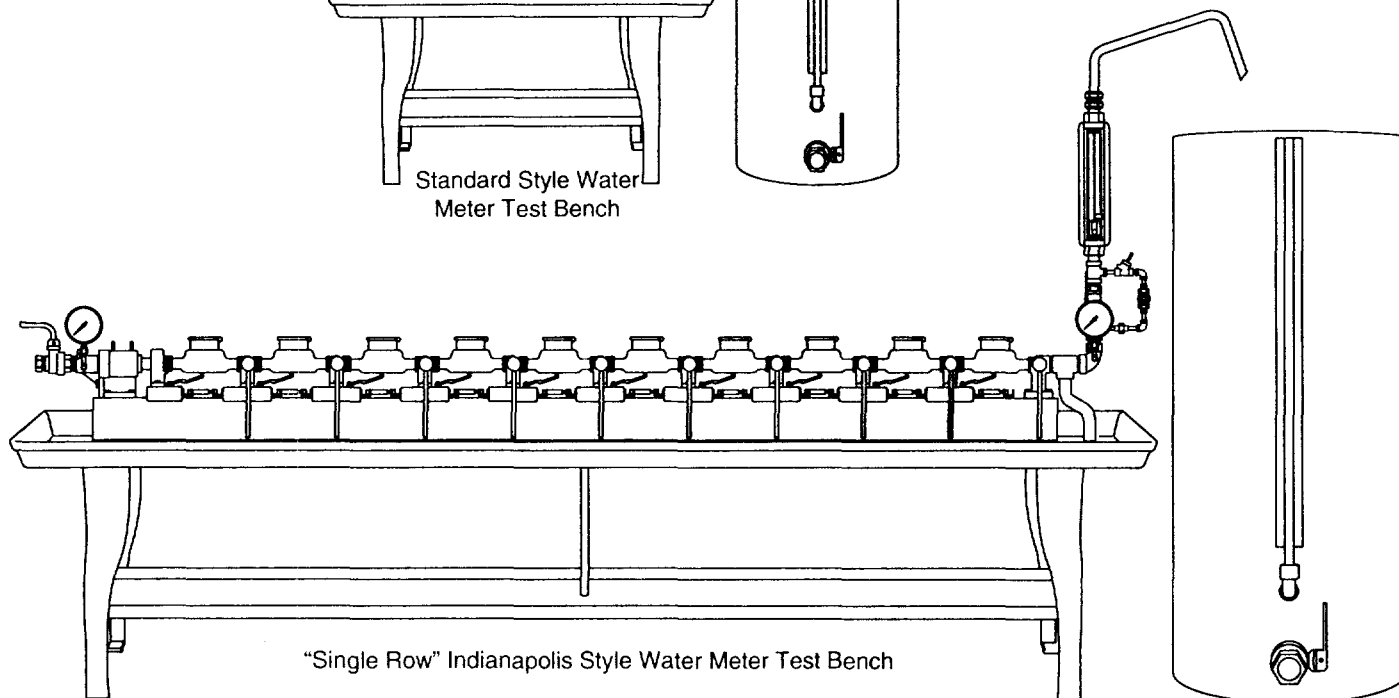
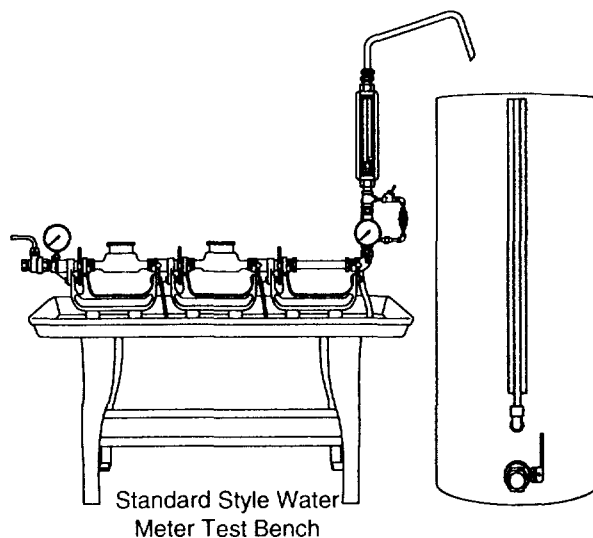


CATALOG SECTION J CONTAINS A VARIETY OF ADDITIONAL ITEMS INCLUDING:

- Pack Joint Nuts and Parts
- Copper Rounding Tools
- Copper Tube Nuts for flare connections
- Thaw wire copper tube nuts for flare copper connections
- Brass Bushings
- Reducing Couplings
- Brass Service Plugs
- Copper Disks to plug service at flare copper connections
- Copper gaskets for flare copper connections (for adapters which replace copper flare nut)
- Straight Insert Fittings for PE Plastic Pipe
- Ell Insert Fittings for PE Plastic Pipe
- Service Tee Insert Fitting for 1" PE Plastic Pipe
- Stainless Steel Clamps for PE Pipe
- Flare Nuts for PE Pipe (replaces copper flare nut)

TESTING EQUIPMENT

SECTION K



STANDARD TEST BENCHES

(for 5/8" through 1" Meter)

INDIANAPOLIS STYLE TEST BENCHES

(for 5/8" and/or 5/8"x3/4" Meter or 5/8" through 1" Meter)

AKRON STYLE TEST BENCHES

(for 1-1/2" through 2" Meter)

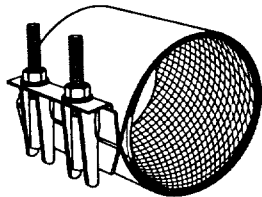
OTHER ITEMS FOR WATER METER TESTING EQUIPMENT

ELECTRIC VALVE FLOW CONTROL EQUIPMENT
 CALIBRATED TESTING TANKS
 PARTS FOR STANDARD TEST BENCHES
 PARTS FOR INDIANAPOLIS TEST BENCHES
 PARTS FOR AKRON TEST BENCHES
 GASKETS FOR AKRON TEST BENCHES
 METER ADAPTERS FOR AKRON BENCHES
 MISCELLANEOUS TESTER AND TANK PARTS
 METER SHOP ACCESSORIES
 TESTER CLAMPS FOR TESTING UP TO 6" METERS

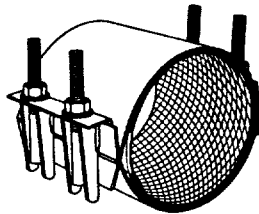
PIPE REPAIR PRODUCTS

SECTION L

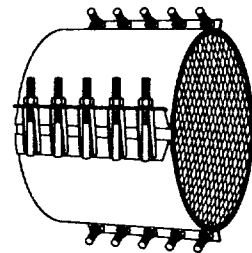
ALL STAINLESS REPAIR CLAMPS



Style FS1 Single Band



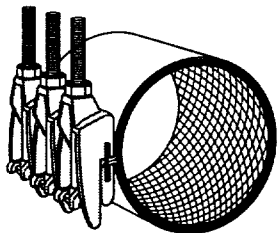
Style FS2 Double Band



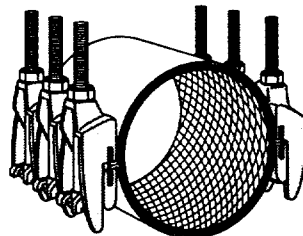
Style FS3 Triple Band

FORDFLEX REPAIR CLAMPS

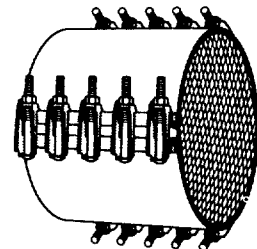
STAINLESS STEEL SLEEVE WITH HEAVY DUTY DUCTILE IRON LUG CONSTRUCTION



Style F1 Single Band



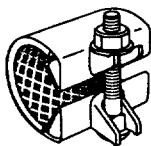
Style F2 Double Band



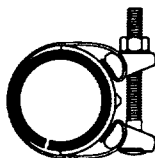
Style F3 Triple Band

SNAP CLAMPS & WRAP CLAMPS

Style FSC

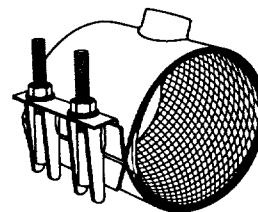


Style FSC "-R"
featuring a 360° gasket
U.S. Pat. No. 5219001



TAPPED REPAIR CLAMPS

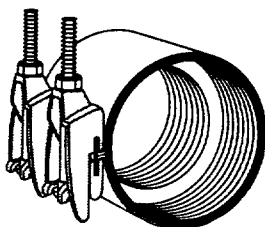
3/4" through 2" Taps.
IP, CC/AWWA or BSP



COUPLING & INTEGRAL BELL CLAMP FOR PVC

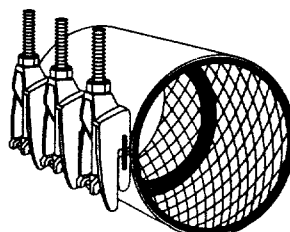
Style FCC

(Schedule 40
Solvent Weld PVC)



Style FIBC

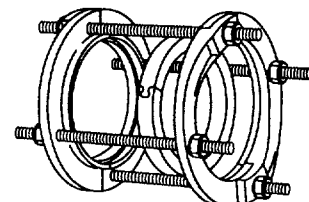
(Class 160 and
200 Solvent Weld PVC)



BELL JOINT LEAK CLAMPS

Style FBC

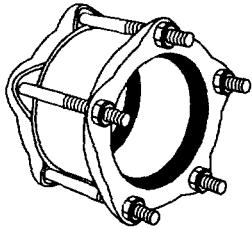
For PVC, Std. Steel Size,
Cast Iron Pipe and C900 PVC



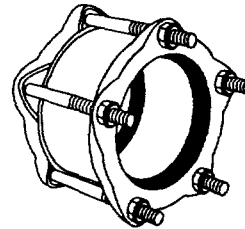
BOLTED FLEX COUPLINGS

SECTION M

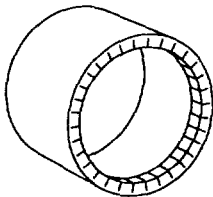
DUCTILE IRON COUPLINGS
STYLE FC1



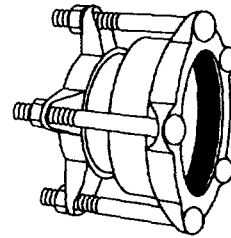
DUCTILE IRON TRANSITION COUPLINGS
STYLE FC2A



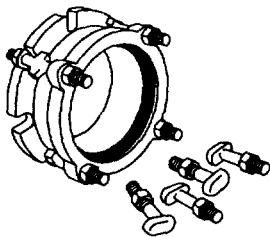
INSULATING BOOT FOR
IRON OR STEEL PIPE



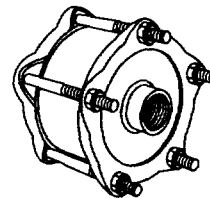
CAST IRON REDUCING COUPLINGS
STYLE FRC



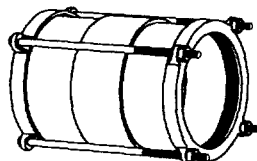
IRON FLANGED COUPLING ADAPTERS
STYLE FFCA



END CAP COUPLINGS
STYLE FEC



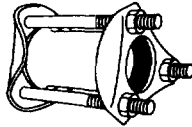
CUT-IN COUPLINGS
STYLE FRR



FABRICATED STEEL PRODUCTS

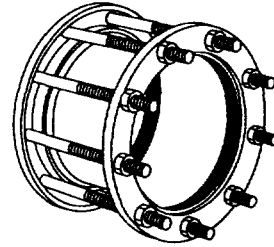
SECTION N

STANDARD STEEL COUPLINGS STYLE FC3



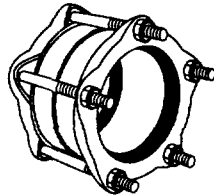
for pipe
sizes 1/2"
thru 12"

STANDARD STEEL COUPLINGS STYLE FC4

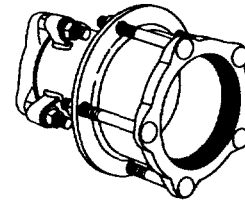


for pipe
sizes 14"
thru 60"

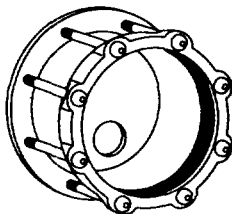
STEEL TRANSITION COUPLINGS STYLES FC23 AND FC5 Joins most pipe within each nominal size



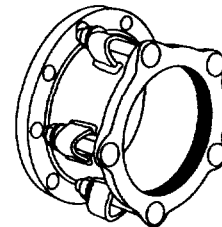
STEEL REDUCING COUPLINGS STYLE FC6



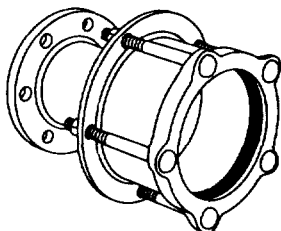
STEEL END CAP COUPLINGS STYLE FC4



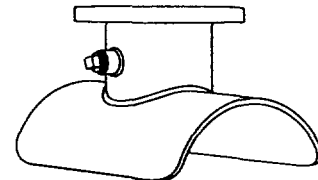
STEEL FLANGE COUPLING ADAPTERS STYLE FCA



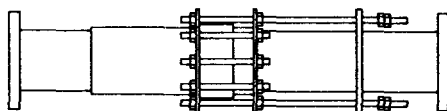
STEEL REDUCING FLANGE COUPLING ADAPTERS STYLE FCA



STEEL WELD-ON TAPPING SLEEVES STYLE FWS

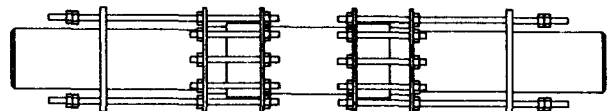


SINGLE END EXPANSION JOINTS STYLE FEJ



Flange End Expansion Joint

DOUBLE END EXPANSION JOINTS STYLE FEJ



Plain End Expansion Joint

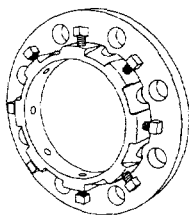
FORD / UNI-FLANGE

ADAPTER FLANGES

SERIES 200 ADAPTER FLANGE FOR STEEL AND DUCTILE IRON PIPE

FLANGE DRILLING ANSI B16.1 125 LB.
AND ANSI B16.5 150 LB.

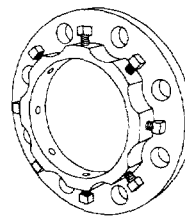
*WORKING PRESSURE - 2" THROUGH 8" 200 PSI
10" THROUGH 12" 175 PSI*



SERIES 400 ADAPTER FLANGE FOR STEEL AND DUCTILE IRON PIPE

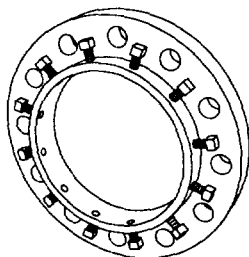
FLANGE DRILLING ANSI B16.1 125 LB.
AND ANSI B16.5 150 LB.

*WORKING PRESSURE - 2" THROUGH 12" 250 PSI
14" THROUGH 24" 150 PSI
30" THROUGH 48" 100 PSI*



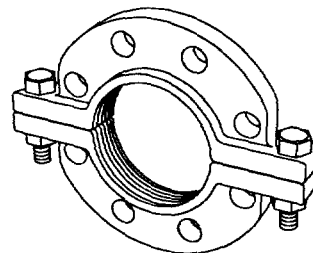
SERIES 420 EXTRA HEAVY ADAPTER FLANGE FOR STEEL

AND DUCTILE IRON PIPE FLANGE DRILLING
ANSI B16.1 250 LB. AND ANSI B16.5 300 LB.
WORKING PRESSURE - 2" THROUGH 12" 400 PSI



SERIES 900 ADAPTER FLANGE FOR PVC PIPE

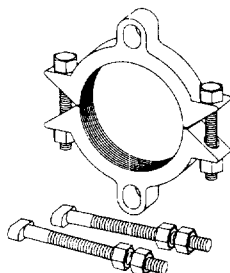
FLANGE DRILLING ANSI B16.1 125 LB.
AND ANSI B16.5 150 LB.



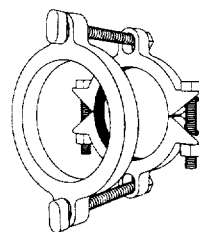
FORD / UNI-FLANGE

RESTRAINERS

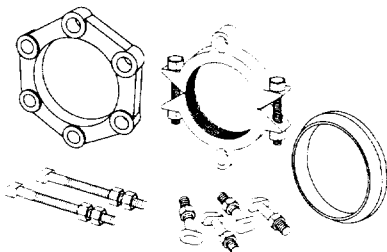
SERIES 1300 RESTRAINERS FOR PVC



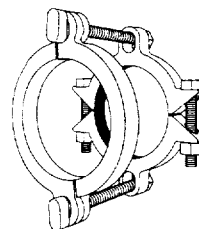
SERIES 1350 RESTRAINERS FOR PVC PIPE
FOR RESTRAINING BELL JOINTS OF PVC PIPE
(NEW PIPE INSTALLATIONS ONLY)
U.S. PAT No. 4336959



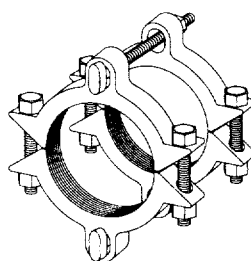
SERIES 1300 RESTRAINER ACCESSORY SETS FOR PVC & DUCTILE IRON PIPE



SERIES 1360 RESTRAINERS FOR PVC PIPE
FOR RESTRAINING PVC PIPE AND PVC PRESSURE
FITTING JOINTS
U.S. PAT No. 4336959



SERIES 1390 RESTRAINERS FOR PVC AND DUCTILE IRON PIPE
FOR RESTRAINING BELL JOINTS OF PVC PIPE OR DUCTILE IRON PIPE
U.S. PAT No. 4336959

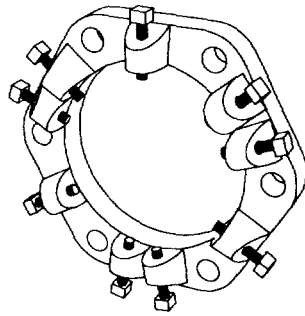


FORD / UNI-FLANGE

RESTRAINERS

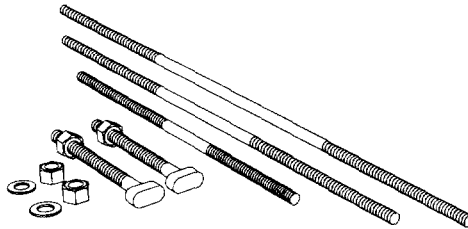
MODEL B RETAINER GLAND

HEAVY DUTY DUCTILE IRON MECHANICAL JOINT RETAINER GLAND



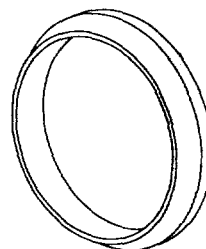
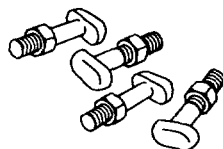
FORD / UNI-FLANGE - MISCELLANEOUS HARDWARE

MISCELLANEOUS HARDWARE FOR SERIES 1300 / 1350 / 1390 RESTRAINERS



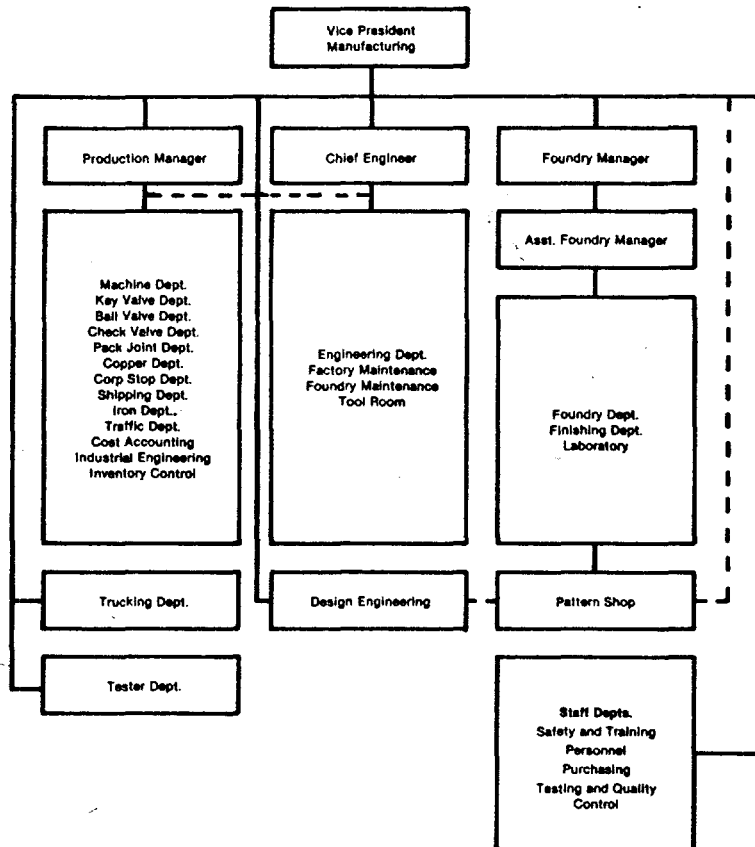
MISCELLANEOUS HARDWARE

T-BOLTS AND NUTS, HIGH STRENGTH LOW ALLOY AWWA C111 AND
MECHANICAL JOINT GASKETS/TRANSITION GASKETS AWWA C111



Appendix B
Organization Chart

FACTORY ORGANIZATION CHART



Appendix C
Examples of Reports

The Ford Meter Box Company
Cost and Price Report
Date XX-YY-ZZ

<u>Part</u>	<u>Labor</u>	<u>Brass</u>	<u>Overhead</u>	<u>TTL Cost</u>	<u>Markup</u>	<u>TTL Price</u>
-------------	--------------	--------------	-----------------	-----------------	---------------	------------------

The Ford Meter Box Company
Brass Purchase Report
For: XX-YY-ZZ to XX-YY-ZZ

<u>Purch. Date</u>	<u>Invoice#</u>	<u>Pounds</u>	<u>Price/Pound</u>	<u>TTL Cost</u>
--------------------	-----------------	---------------	--------------------	-----------------

Weighted Average Cost Per Pound XX-YY-ZZ:

Appendix D

Chart Matching CSFs With Internal Reports

MATCHING CRITICAL SUCCESS FACTORS WITH INTERNAL REPORTS

	CSFs				
	(1)	(2)	(3)	(4)	(5)
1. Cost and Price Report	X				
2. Piecerate Summary Sheet		Supports Cost and Price Report			
3. Brass Purchase Report	X			X	
4. Brass Used Report	X			X	
5. Internal Income					
6. Inventory Report				X	

CRITICAL SUCCESS FACTORS

1. Keeping raw materials costs to a minimum
2. Product quality
3. Customer service
4. Raw materials and finished goods inventory maintainance
5. Adequate scheduling for different jobs

Appendix E
Research Questionnaire

QUESTIONS FOR 499 PROJECT

Basic Information:

Name (Not Necessary):

Title (Not Necessary):

Management Level: High___ Middle___ Lower___

Basic Description of Job:

Information on Company:

History:

*Ernst,
Jill*

Products:

Production Process:

Questions:

Keeping in mind the production process, what elements are critical in order to be successful?

1)

2)

3)

4)

5)

What kinds of Accounting (Cost, Inventory, ect. . .) Reports do you use or make and what value do they give to your job? (Examples, without numbers!!!!!!)

Are you dissatisfied by any reports that you receive or produce? Why?

What things would you change about the reports that you receive or produce?

Any other Comments.....

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